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EXAMINER	
THOMAS, MIA M	

ART UNIT	PAPER NUMBER
2624	

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/538,093

Applicant(s)

PHILOMIN ET AL.

Examiner

Mia M. Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 0205 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date see attached.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Amendment*

1. This Office Action is responsive to the applicant's remarks received on 08 June 2005. Claims 1-23 remain pending. The following paragraph had been added before the first paragraph at page 1, line 1:

#### CROSS REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. provisional application serial no. 60/433,374 filed December 13, 2002, which is incorporated herein by reference.

Examiner has accepted and entered applicant's preliminary amendment for instant application 10/538,093.

### *Drawings*

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show appropriate contrast, pertinent details, and conceptually relevant features as described in the specification. Regarding Figures 1A-1C, there are not many details, if any that are visible in the copy submitted with this application. Regarding Figures 1D-1F, the contrast to support "expressive facial features" is not present. Regarding Figure 2B, it appears that "X" symbols are present, however, based on the contrast presented, the "X" symbols are hardly recognizable. Figure 5 also lacks appropriate contrast. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must

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be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 23 is rejected under 35 U.S.C. 102(b) as being anticipated by Kado et al (US 5,410,609 A).

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**Regarding Claim 23:** Kado discloses a face detection system (Refer to Figure 1; "This invention relates to an apparatus for identification of individuals by making use of a data base of their facial images that are inputted from a video camera and the like." at column 1, line 7), comprising: a capturing device that captures a facial image that has expressive features (Refer to Figure 1, numeral 1, "Visual Image Input Unit"); a facial feature locator which locates the expressive features of the captured facial image (Refer to Figure 1, numeral 2, "Characteristics Extracting Unit"; specifically, figure 2, numeral 12 "is a characteristics extracting unit consisting of an A/D converter, a central processing device, a memory, etc..." at column 1, line 19); a comparator which compares the pixels within the expressive features of the captured facial image with the pixels within the expressive features of the stored images (Refer to Figure 1, numeral 4), and if there is no match with any expressive feature of the stored images then storing in a memory the location of the expressive feature of the captured image (Refer to Figure 1, numeral 5 and 6); the comparator also compares 1) the captured image, minus the location of the non-matching expressive features, with 2) the stored images minus the coordinates of the non-matching expressive features (Movement vectors for expression muscles are stored in the data base of expression muscles 5 for each of a plurality of individuals to be identified. The expression muscles work are used when facial expressions such as "smile" or "cry" are made. To detect the movement of the expression muscles, the facial dimensions of the subjects to be recognized and an expression serving as the criterion are needed. Therefore, changes in the expression muscles, e.g. the movement vectors, are represented by relative distances between the characteristic points, and the changes thereof when the face of the subject is expressionless." at column 4, line 24. For a more detailed example, see column 4, lines 35-46).

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1. Claims 1,3,11,18 are rejected under 35 U.S.C. 102(b) as being anticipated by Bortolussi et al (US 6,292,575 B1).

**Regarding Claim 1:** Bortolussi discloses a method of comparing a captured image with stored images ("A system and method for acquiring, processing, and comparing an image with a stored image to determine if a match exists." at abstract), comprising:

capturing a facial image that has expressive features (Refer to Figure 1, numeral 22; "FIG. 1 is a schematic block diagram of a real time facial recognition system according to the teachings of the present invention." at column 3, line 33);

locating the expressive features of the captured facial image (Refer to Figure 1, numerals 28 and 30);

comparing an expressive feature of the captured facial image with the like expressive feature of the stored images (Refer to Figure 9, numeral 345), and if there is no match with any like expressive feature of the stored images then marking the expressive feature as a marked expressive feature (Refer to Figure 12, numeral 405; "Store Eigen Coefficients for Acquired Image");

comparing: 1) the captured image, minus the marked expressive feature, with 2) the stored images minus the like expressive feature that corresponds to the marked expressive feature (Refer to Figure 1, numeral 34).

**Regarding Claim 3:** Bortolussi discloses the method as claimed in claim 1, wherein the locations of the expressive features are found using an optic flow technique (Refer to Figure 3, numeral 54; "The motion detection stage 54 receives a number of input signals, as illustrated, such as signals corresponding to frame width and height, frame bit counts and type, maximum

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number of frames, selected sampling pixel rate, motion threshold values, maximum and minimum head size, and RGB index threshold values." at column 5, line 22).

**Regarding Claim 11:** Bortolussi discloses a device for comparing pixels within a captured image with pixels within stored images ("A system and method for acquiring, processing, and comparing an image with a stored image to determine if a match exists." at abstract), comprising:

a capturing device that captures a facial image having expressive features (Refer to Figure 1, numeral 22; "FIG. 1 is a schematic block diagram of a real time facial recognition system according to the teachings of the present invention." at column 3, line 33);

a facial feature locator which locates the expressive features of the captured facial image (Refer to Figure 1, numerals 28 and 30);

a comparator which compares the expressive features of the captured facial image with the like expressive features of the stored images (Refer to Figure 1, numeral 20; These stages include an image acquisition stage 22, a frame grabber stage 26, a head find stage 28, an eye find stage 30, and an image manipulation stage 34." at column 4, line 24),

and if there is no match with any expressive feature of the stored images then marking the expressive feature of the captured image as a marked expressive feature (Refer to Figure 12, numeral 405; "Store Eigen Coefficients for Acquired Image");

the comparator also compares 1) the captured image, minus the marked expressive features, with 2) the stored images minus the like expressive feature that corresponds to the marked expressive feature (Refer to Figure 1, numeral 34).

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**Regarding Claim 18:** Bortolussi discloses a device for comparing pixels within a captured image with pixels within stored images ("A system and method for acquiring, processing, and comparing an image with a stored image to determine if a match exists." at abstract), comprising:

capturing means for capturing a facial image that has expressive features (Refer to Figure 1, numeral 22); facial feature locating means for locating the expressive features of the captured facial image (Refer to Figure 1, numeral 28 and 30); comparing means which compare the pixels within the expressive features of the captured facial image with the pixels within the expressive features of the stored images (Refer to Figure 1, numeral 20), and if there is no match with any expressive feature of the stored images then storing in a memory the location of the expressive feature of the captured image (Refer to Figure 12); the comparing means also for comparing 1) the pixels within the captured image, minus the pixels within the location of the non-matching expressive features, with 2) the pixels within the stored images minus the pixels within the location of the non-matching expressive features (Refer to Figure 1, numeral 34).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2,4-10,12,13,16,17,19,20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bortolussi et al (US 6,292,575 B1) in combination with Tian (US 6,879,709 B2).



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**Regarding Claim 2:**

Bortolussi discloses capturing a facial image that has expressive features (Refer to Figure 1, numeral 22; "FIG. 1 is a schematic block diagram of a real time facial recognition system according to the teachings of the present invention." at column 3, line 33).

Bortolussi does not specifically disclose wherein the captured image is in the form of a face model and the stored images are in the form of face models.

Tian teaches the method as claimed in claim 1, wherein the captured image is in the form of a face model (Refer to Figure 4, numeral 430) and the stored images are in the form of face models ("A database of individuals wherein characteristic points of expressionless facial image are stored represents the enrolled population." at column 6, line 39).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to utilize the captured and stored images in the form of a face models as taught by Tian with the facial image as disclosed by Bortolussi because "the appearance of a [neutral] face is needed for all existing automated facial expression analysis systems." (Tian at column 1, line 16).

**Regarding Claim 12:** Tian teaches a device which equally resembles the claimed subject matter of Claim 2. Claim 12 is rejected for the same grounds, rationale and motivation as listed above at Claim 2.

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**Regarding Claim 4:**

Bortolussi discloses capturing a facial image that has expressive features (Refer to Figure 1, numeral 22; "FIG. 1 is a schematic block diagram of a real time facial recognition system according to the teachings of the present invention." at column 3, line 33).

Bortolussi does not specifically disclose wherein the face models are created using a classifier.

Tian teaches the method as claimed in claim 2, wherein the face models are created using a classifier (Refer to Figure 4, numeral 460).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to utilize a classifier as disclosed by Tian with the facial images captured by Bortolussi because "...by feeding these [facial] features to a classifier, the system detects if there is the neutral expressionless face or not." (Tian at abstract).

**Regarding Claim 5:** Tian teaches the method as claimed in claim 4, wherein the classifier is a neural network (Refer to Figure 14, numeral 1410; "FIG. 14 shows a neutral face classifier that compares the features associated with an unknown expression to features associated with neutral and non-neutral expression through a neural network and through nearest-neighbor classification." at column 9, line 1).

**Regarding Claim 6:** Tian teaches the method as claimed in claim 4, wherein the classifier is a Maximum-Likelihood distance metric ("To develop a procedure for identifying images or videos as belonging to particular classes or categories (or for any classification or pattern recognition task, for that matter), supervised learning technology can be based on decision trees, on logical

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rules, or on other mathematical techniques such as linear discriminant methods (including perceptrons, support vector machines, and related variants), nearest neighbor methods..." at column 4, line 56).

**Regarding Claim 13:** Tian teaches the device which equally resembles the claimed subject matter of Claim 6. Claim 13 is rejected for the same grounds, rationale and motivation as listed above at Claim 6.

**Regarding Claim 7:** Tian teaches the method as claimed in claim 4, wherein the classifier is a Bayesian Network ("To develop a procedure for identifying images or videos as belonging to particular classes or categories (or for any classification or pattern recognition task, for that matter), supervised learning technology can be based on decision trees, on logical rules, or on other mathematical techniques such as linear discriminant methods (including perceptrons, support vector machines, and related variants), nearest neighbor methods, Bayesian inference..." at column 4, line 56).

**Regarding Claim 8:** Tian teaches the method as claimed in claim 4, wherein the classifier is a radial basis function ("To develop a procedure for identifying images or videos as belonging to particular classes or categories (or for any classification or pattern recognition task, for that matter), supervised learning technology can be based on decision trees, on logical rules, or on other mathematical techniques such as linear discriminant methods (including perceptrons, support vector machines, and related variants)..." at column 4, line 56).

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**Regarding Claim 9:**

Bortolussi discloses comparing an expressive feature of the captured facial image with the like expressive feature of the stored images (Refer to Figure 9, numeral 345);

Bortolussi does not specifically disclose wherein the steps of comparing compare the pixels within expressive feature of the captured image with the like pixels within the expressive feature of the stored images.

Tian teaches the method as claimed in claim 1, wherein the steps of comparing compare the pixels within expressive feature of the captured image with the like pixels within the expressive feature of the stored images (Refer to Figure 12, numeral 1210 and 1220).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add together the steps of comparing as taught by Tian with the step of comparing as disclosed by Bortolussi because "a face detection system finds positions and scales of the faces in images and videos. A robust face detector flexibly and reliably detects the face in the image or video, regardless of lighting conditions, background clutter in the image, multiple faces in the image, as well as variations in face position, scale, pose and expression." (Tian at column 1, line 37).

**Regarding Claim 16:** Tian teaches the device which equally resembles the claimed subject matter of Claim 9. Claim 16 is rejected for the same grounds, rationale and motivation as listed above at Claim 9.

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**Regarding Claim 10:**

Bortolussi discloses if there is no match with any like expressive feature of the stored images then marking the expressive feature as a marked expressive feature (Refer to Figure 12, numeral 405; "Store Eigen Coefficients for Acquired Image");

Bortolussi does not specifically disclose wherein the step of marking stores the coordinates of the non-matching expressive feature of the captured image.

Tian teaches the method as claimed in claim 1, wherein the step of marking stores the coordinates of the non-matching expressive feature of the captured image (Refer to Figure 4, numeral 440).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to utilize mark[ing] the coordinates of the non-matching expressive features of the captures image as taught by Tian with the method of marking the expressive features as disclosed by Bortolussi because by storing the non-matching features the "Characteristic point detector" (Figure 4, numeral 440) will be able to also classify a "neutral or non-neutral" facial expression. Additionally by marking the non-matching expressions, the "Image Acquisition Device" (Figure 4, numeral 410) will enhance the library of facial features for further analysis.

**Regarding Claim 17:** Tian teaches the device which equally resembles the claimed subject matter of Claim 10. Claim 17 is rejected for the same grounds, rationale and motivation as listed above at Claim 10.

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**Regarding Claim 19:**

Bortolussi discloses capturing a facial image that has expressive features (Refer to Figure 1, numeral 22; "FIG. 1 is a schematic block diagram of a real time facial recognition system according to the teachings of the present invention." at column 3, line 33).

Bortolussi does not specifically disclose the device in accordance with claim 18, wherein the images are stored as face models.

Tian teaches the device in accordance with claim 18, wherein the images are stored as face models (Refer to Figure 4, numeral 430).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to utilize the captured and stored images in the form of a face models as taught by Tian with the facial image as disclosed by Bortolussi because "the appearance of a [neutral] face is needed for all existing automated facial expression analysis systems." (Tian at column 1, line 16).

**Regarding Claim 20:** Tian teaches the device in accordance with claim 18, wherein the locator is a maximum likelihood distance metric ("To develop a procedure for identifying images or videos as belonging to particular classes or categories (or for any classification or pattern recognition task, for that matter), supervised learning technology can be based on decision trees, on logical rules, or on other mathematical techniques such as linear discriminant methods (including perceptrons, support vector machines, and related variants), nearest neighbor methods..." at column 4, line 56).

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**Regarding Claim 21:** Tian teaches the device in accordance with claim 19, wherein the face models are created using radial basis functions ("To develop a procedure for identifying images or videos as belonging to particular classes or categories (or for any classification or pattern recognition task, for that matter), supervised learning technology can be based on decision trees, on logical rules, or on other mathematical techniques such as linear discriminant methods (including perceptrons, support vector machines, and related variants)..." at column 4, line 56).

**Regarding Claim 22:** Tian teaches the device in accordance with claim 19, wherein the face models are created using Bayesian networks ("To develop a procedure for identifying images or videos as belonging to particular classes or categories (or for any classification or pattern recognition task, for that matter), supervised learning technology can be based on decision trees, on logical rules, or on other mathematical techniques such as linear discriminant methods (including perceptrons, support vector machines, and related variants), nearest neighbor methods, Bayesian inference..." at column 4, line 56).

7. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bortolussi et al (US 6,292,575 B1) in combination with Kado (US 5,410,609 A).

**Regarding Claim 14:**

Bortolussi discloses a device for comparing pixels within a captured image with pixels within stored images ("A system and method for acquiring, processing, and comparing an image with a stored image to determine if a match exists." at abstract), comprising: a capturing device that captures a facial image having expressive features.

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Bortolussi does not specifically disclose the device as claimed in claim 11, wherein the capturing device is a video grabber.

Kado discloses the device as claimed in claim 11, wherein the capturing device is a video grabber (Refer to Figure 1, numeral 1, "Visual Image Input Unit").

At the time the invention was made, it would have been obvious to one of ordinary skill in the art utilize a video grabber as taught by Kado as the capturing device as disclosed by Bortolussi because "A system for the digitization of analog video is referred to as a video frame grabber. The analog video signals carry the information about an image in such a way that the image can be directly visualized on a video monitor. (Jennes at column 1, line 17).

#### **Regarding Claim 15:**

Bortolussi discloses a device for comparing pixels within a captured image with pixels within stored images ("A system and method for acquiring, processing, and comparing an image with a stored image to determine if a match exists." at abstract), comprising: a capturing device that captures a facial image having expressive features.

Bortolussi does not specifically disclose the device as claimed in claim 11, wherein the capturing device is a storage medium.

Kado discloses the device as claimed in claim 11, wherein the capturing device is a storage medium (Refer to Figure 2, numeral 12; "Characteristic Extracting Unit"; "...consisting of an A/D converter, a central processing unit, a memory, etc...").



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At the time the invention was made, it would have been obvious to one of ordinary skill in the art ensure that the device as disclosed by Bortolussi contains a capturing device [that] is a storage medium as taught Kado because the comparison of expressive features in the captured and the stored image cannot occur if no storage medium exists. Accordingly with the flow chart of Figure 2 (Tian), the Image Processing (Figure 2, numeral 14) cannot occur without memory storage of some sort at (Figure 2, numeral 12).

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 5,717,469 Jennes et al. describes the definition of a video grabber and shows the motivation for utilizing a video grabber in as a visual image input unit. This reference was used as a motivational ground of rejection for claim 14 and as a definition for the term "video grabber."

#### **United States Patents:**

6,101,264	6,819,783	6,181,805
4,975,969	5,892,838	6,947,578
6,205,233	5,229,764	6,876,755

Department of Computer Science. "Computer Vision Research Group-Optical flow Algorithm Evaluation", University of Otago, Dunedin, New Zealand. <http://of-eval.sourceforge.net>. Pages 1-3.

Melnik, O. "Representation of Information in Neural Networks". Department of Neuroscience, Brandeis University. Pages 1-135.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is 571-270-1583. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on 571-272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mia M Thomas  
Examiner  
Art Unit 2624

*Mia M. Thomas*



BRIAN WERNER  
SUPERVISORY PATENT EXAMINER